Georgia Department of Public Health

Mumps

Specimen Collection and Shipping Instructions

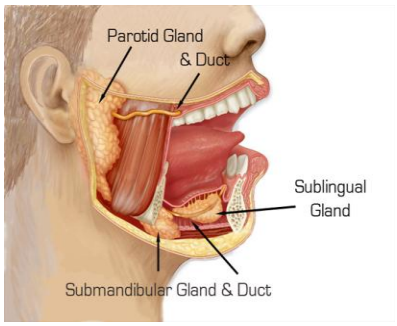
Mumps is a contagious viral infection typically characterized by acute onset of unilateral or bilateral, tender swelling of parotid or other salivary glands, often preceded by a nonspecific prodrome, including muscle aches, loss of appetite, malaise, headache, and fever. Mumps should be considered in the differential diagnosis of such patients regardless of vaccination history.

The Georgia Department of Public Health strongly recommends the **collection of serum for mumps IgM/IgG AND collection of two buccal swabs and a urine specimen to confirm a mumps case**. To coordinate specimen collection and laboratory submission, call your District Health Office or the DPH Acute Disease Epidemiology Section at 404-657-2588 during business hours Monday through Friday, or 1-866-PUB-HLTH after-hours on evenings and weekends. **Please do not send specimens directly to the Georgia Public Health Laboratory (GPHL) or the Centers for Disease Control and Prevention (CDC).**

Specimen Collection Instructions

Viral Testing: The preferred method for confirming acute infection is detection of mumps virus from a buccal specimen by reverse transcriptase-polymerase chain reaction testing (RT-PCR). Collection of a buccal specimen as soon as possible after parotitis onset is optimal, although virus may be detected for up to 9 days.

Collection of Buccal Swab: Use a **viral transport kit** (such as for influenza or herpes simplex virus isolation)



- Prior to obtaining the specimen, the parotid gland, which extends from in front of the ear to the angle of the jaw line and drains at the buccal mucosa, should be massaged for 30 seconds.
- Vigorously swab the buccal cavity (the space near the upper rear molars between the cheek and teeth) with a sterile synthetic swab (e.g. Dacron). Synthetic swabs are preferred over cotton swabs.
- Place swab in a tube containing 2-3 ml of viral transport medium or other sterile isotonic solution (phosphate buffered saline or cell culture medium). Ream the swab around the rim of the tube to retain cells and fluid in the tube. The swab can be broken off and left in the tube.
- Samples should be maintained at 4° C (39° F) and shipped on cold packs within 24 hours.
- Detailed instructions are available at https://www.cdc.gov/mumps/lab/detection-mumps.html

Urine Specimens: Urine samples have not been as useful for virus isolation or detection of mumps RNA. Urine may not be positive for mumps virus until >4 days after symptom onset.

- Collect 10-15 ml of urine in a screw top sterile container
- Sample should be maintained at 4°C (39°F) and shipped on cold packs within 24 hours.

Acute Disease Epidemiology
2 Peachtree St., NW
Atlanta, GA 30303
404-658-2588 or 1-866-PUB-HLTH
http://dph.georgia.gov/vaccine-preventable-diseases

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Serologic Testing: The first (acute-phase*) serum sample for mumps IgM and IgG antibody testing should be collected as soon as possible upon suspicion.

- Collect 7-10 ml of blood in a serum separator tube (SST)
- SST tubes must be centrifuged and the serum transferred into a transport tube for shipment.
- Samples should be maintained at 4° C (39° F) and shipped on cold packs within 24 hours.

*If the acute-phase serum sample collected ≤ 3 days after parotitis onset is negative, and the case has a negative (or not done) RT-PCR, a second serum sample collected 5-10 days after symptom onset is recommended because, in some cases, the IgM response is not detectable until 5 days after symptom onset.
*IgG acute-phase and convalescent-phase sera should be collected 10-14 days apart.

Laboratory Submission Instructions

1. Notify your District Public Health Office or the Vaccine Preventable Disease Epidemiology Unit **immediately**.
2. Label the specimen containers (transport media, urine, and/or blood) with the patient's name, date of birth, and date of specimen collection (UNAPPROVED OR UNLABELED SPECIMENS WILL NOT BE TESTED)
3. Complete the Georgia Public Health Laboratory Submission Form found at: https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/GPHL%20Lab%20Submission%20Form.pdf with the following information:
    a. Submitter code (if known), address, phone and fax number, and contact name
    b. Patient name, address, phone number, date of birth, sex, race, and ethnicity (if available)
    c. Date of specimen collection, source, type of specimen, clinical history and information
    d. If requesting IgM and/or IgG, under "Immunology" check BOTH of the following boxes: *Mumps IgG W15550 Decatur* OR *W15550 Waycross*, and *1570 Refer to CDC*. Write Mumps IgM in the space next to *Refer to CDC*.
    e. If requesting a culture, under "Virology" check the box labeled *60000 Mumps Culture/IFA*
    f. If requesting a PCR, under "Molecular Biology" check the box labeled *413000 Mumps (RT-PCR)*

    NOTE: A separate submission form needs to be completed for EACH specimen submitted (i.e. if two buccal specimens are collected – one for culture and one for PCR, two GPHL submission forms need to be completed).
4. Ship specimens overnight by courier or UPS/FedEx on ice packs. **DO NOT SEND SPECIMENS VIA the United States Postal Service (USPS).** If there is a delay in shipment, the sample is best preserved by freezing at -70°C. Frozen samples should be shipped on dry ice.
5. Ship specimens to the following address:

    Georgia Public Health Laboratory
    1749 Clairmont Road
    Decatur, GA 30033-4050
    ATTN: Molecular Laboratory

Contact Information

- For specimen outfit requests call the Georgia Public Health Laboratory at 404-327-7921
- For questions related to specimen collection and transport: contact local or district public health or the State VPD Epidemiology Unit, 404-657-2588

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Interpretation of Mumps Laboratory Test Results

- RT-PCR
    - PCR: While detection of viral RNA by RT-PCR confirms mumps infection, failure to detect mumps virus RNA by RT-PCR in samples from a person who meets the clinical case definition for mumps does not rule out mumps as a diagnosis. Vaccinated people may shed virus for a shorter period and might shed smaller amounts of virus, thus degradation of the sample has greater consequences for successful detection of virus in such people. In outbreaks among two-dose vaccine recipients, mumps virus RNA was detected in samples from 30-35% of case-patients if the samples were collected within the first 3 days following onset of parotitis. Successful detection of mumps virus depends primarily on the timing of collection and the quality of the viral sample.

- Viral Culture
    - Isolation of mumps virus from any clinical specimen constitutes laboratory confirmation of mumps.

- Serology
    - Positive IgM result: In unvaccinated persons, IgM antibody is detectable within 3 days after onset of parotitis, reaches a maximum level about a week after onset, and remains elevated for several weeks or months. In either vaccinated or unvaccinated people, a positive IgM test result indicates current/very recent infection or reinfection. If the acute specimen is IgM positive, a second specimen is not necessary. If an acute specimen collected ≤3 days after parotitis onset in an unvaccinated person is IgM negative, testing a second sample collected 5-7 days after symptom onset is recommended, since the IgM response may require more time to develop. A second negative IgM result does not rule out mumps unless IgG is also negative. False positive mumps IgM results can occur due to parainfluenza virus 1, 2, and 3, Epstein-Barr virus, adenovirus, and human herpesvirus 6 infections.

      Negative IgM result: The absence of a mumps IgM response in a vaccinated or previously infected person presenting with clinically compatible mumps symptoms does not rule out mumps as a diagnosis. In vaccinated people, IgM may be falsely negative. As with measles and rubella, mumps IgM may be transient, late occurring, or missing in persons who have had any doses of mumps-containing vaccine. There is some evidence that serum collected ≥10 days after parotitis onset may improve the ability to detect IgM among persons who have received 1 or 2 doses of MMR. However, vaccinated persons may not have detectable mumps IgM antibody regardless of the timing of specimen collection

    - IgG: IgG alone is not diagnostic unless you obtain both an acute (can be done as soon after onset as the patient is seen) and convalescent blood specimen, collected 10-14 days apart, for serologic tests to determine if a four-fold rise in IgG antibody titer has occurred (e.g., from 1:40 to 1:320). In vaccinated persons it may not be possible to detect a four-fold rise in mumps IgG antibody titer in paired serum samples (acute and convalescent). In such persons, the existing IgG will begin to rise soon after exposure and infection. At the time of onset of symptoms and collection of the acute serum, the IgG may already be quite elevated, and obviate the fourfold rise observed in the convalescent serum specimen.

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